

4. (Original) The apparatus of claim 3, wherein said overflow/underflow possible check circuitry uses said largest exponent to determine if said mathematical operation between said first exponent signal and said second exponent signal creates said overflow condition.

5. (Original) The apparatus of claim 3, further comprising:
an exponent shift amount circuitry configured to determine how much the mantissa of said largest exponent must be shifted to be normalized, and configured to compute a normalized exponent.

6. (Original) The apparatus of claim 5, wherein said exponent compare circuitry uses said normalized exponent to determine if said mathematical operation between said first exponent signal and said second exponent signal creates said overflow condition.

7. (Presently Amended) A method for performing an overflow and underflow comparisons ~~while minimizing overflow/underflow~~ with exponent comparison circuitry, comprising the steps of:

~~receiving a first exponent signal and a second exponent signal;~~
~~determining if a mathematical operation involving said first exponent signal and said second exponent signal creates a potential overflow condition;~~
generating a signal indicating if said potential overflow condition exists;
computing an actual overflow condition with said exponent comparison circuitry
if said signal indicates that a potential overflow condition exists; and
computing an actual underflow condition with said exponent comparison circuitry if said signal indicates said potential overflow condition does not exist.

8. (Presently Amended) The method of claim 7, further comprising the steps of:
generating an overflow error signal if an actual overflow condition exists; and
generating an underflow error signal if an actual underflow condition exists.
9. (Original) The method of claim 7, further comprising the step of:
determining a largest exponent between said first exponent signal and said second
exponent signal.
10. (Original) The method of claim 9, further comprising the step of:
using said largest exponent to determine if said mathematical operation between said
first exponent signal and said second exponent signal creates said overflow condition.
11. (Original) The method of claim 9, further comprising the steps of:
determining how much a mantissa of said largest exponent must be shifted to be
normalized, and
computing a normalized exponent.
12. (Original) The method of claim 11, further comprising the steps of:
using said normalized exponent to determines if said mathematical operation between
said first exponent signal and said second exponent signal creates said overflow condition.

13. (Presently Amended) An exponent computation apparatus for performing an overflow and underflow comparisons while minimizing overflow/underflow comparison circuitry, the apparatus comprising:

~~means for receiving a first exponent signal and a second exponent signal;~~

means for determining if a mathematical operation ~~involving said first exponent signal and said second exponent signal~~ creates a potential overflow condition;

means for generating a signal indicating if said potential overflow condition exists; and

means for computing, ~~wherein said computing means computes~~ an actual overflow condition if said signal indicates said potential overflow condition exists, ~~and wherein said computing means computes~~ and an actual underflow condition if said signal indicates said potential overflow condition does not exist.

14. (Original) The apparatus of claim 13, wherein said computing means further comprises:

means for generating an overflow error signal if an actual overflow condition exist; and

means for generating an underflow error signal if an actual underflow condition exist..

15. (Original) The apparatus of claim 13, further comprising:

means for determining a largest exponent between said first exponent signal and said second exponent signal.

16. (Original) The apparatus of claim 13, wherein said computing means further comprises:

means for using said largest exponent to determine if said mathematical operation between said first exponent signal and said second exponent signal creates said overflow condition.

17. (Original) The apparatus of claim 14, further comprising:

means for determining how much a mantissa of said largest exponent must be shifted to be normalized, and
computing a normalized exponent.

18. (Original) The apparatus of claim 17, wherein said computing means further comprises:

means for using said normalized exponent to determine if said mathematical operation between said first exponent signal and said second exponent signal creates said overflow condition.

Claims 19-26 (Cancelled).

Please add the following new claims.

27. (New) An exponent computation apparatus for performing an overflow and underflow comparison while minimizing overflow/underflow comparison circuitry, said apparatus comprising:

overflow/underflow possible check circuitry, said overflow/underflow possible check circuitry configured to determine if a mathematical operation including a first exponent signal and a second exponent signal creates a potential overflow condition, wherein said

overflow/underflow possible check circuitry generates a signal indicating if said overflow condition is a possibility; and

exponent compare circuitry having a series of comparators, said exponent compare circuitry configured to utilize each of said comparators to compute an actual overflow condition if said signal indicates overflow is possible, and said exponent compare circuitry further configured to utilize each of said comparators to compute an actual underflow condition if said signal does not indicate overflow is possible.

28. (New) The apparatus of claim 27, wherein the component is an array of multiplexers configured to select constants based upon said signal received from said underflow/overflow possible check circuitry.

29. (New) The apparatus of claim 28, wherein each multiplexer in said array of multiplexers produces an output corresponding to said signal and each of said outputs is input into a carry save adder in an array of carry save adders.

30. (New) An apparatus of claim 1, wherein the exponent compare circuitry is further configured to perform multiple simultaneous compares of an exponent and a plurality of overflow thresholds, if said signal indicates the possibility of an overflow.

31. (New) An apparatus of claim 1, wherein the exponent compare circuitry is further configured to perform multiple simultaneous compares of an exponent and a plurality of underflow thresholds, if said signal indicates the possibility of an underflow.

32. (New) A method for performing overflow and underflow comparisons with exponent comparison circuitry, comprising the steps of:

- selecting an exponent precision underflow/overflow constant from a plurality of exponent underflow/overflow constants;
- generating a sum signal and a carry signal from one of said plurality of exponent underflow/overflow constants, a pre-normalized exponent signal and a normalization shift amount signal;
- computing an underflow/overflow result from said sum signal and said carry signal; and
- transmitting an underflow/overflow condition based upon said underflow/overflow result and an exponent adjust amount signal.

33 (New) The method of claim 33, wherein the selecting step further comprises selecting said constants via a plurality of constant selectors.

34 (New) The method of claim 34, wherein said plurality of constant selectors comprises two constant selectors.

35 (New) The method of claim 35, wherein the generating step further comprises generating said sum signal and said carry signal via a plurality of carry save adders.

36 (New) The method of claim 36, wherein the computing step further comprises computing said underflow/overflow result via a plurality of comparators.

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37 (New) The method of claim 37, wherein said plurality of comparators further comprises four comparators and wherein a first one of said four comparators uses a least significant bit input of said carry signal from one of said plurality of carry save adders and a carry-in signal to extend the range of said constants being compared.

38 (New) The apparatus of claim 1, wherein said exponent compare circuitry comprises a plurality of underflow/overflow result selectors, each result selector configured to transmit said overflow condition and said underflow condition based upon an underflow/overflow result from a plurality of comparators and further based upon an exponent adjust amount signal.